

WHAT IS CLAIMED IS:

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- 5 1. A trench-type power MOSFET having a vertical invertible channel of one of the conductivity types disposed between a source region and a drain region; a gate oxide and gate contact thereon extending along the length of said invertible channel and operable to invert the conductivity type of said invertible channel; said vertical invertible channel having a constant concentration along its full length.

2. The power MOSFET of claim 1 wherein said one of the conductivity types is the N-type.

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3. The power MOSFET of claim 1 wherein said invertible channel is epitaxially deposited silicon.

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- 5 4. A power MOSFET comprising, in combination; a substrate of one of the conductivity types; an epitaxially deposited layer of the other conductivity type deposited atop said substrate and having a substantially constant concentration; a plurality of spaced trenches having vertical walls extending through said epitaxial layer; a thin gate oxide on said vertical walls and conductive polysilicon deposited into said trenches to define a polysilicon gate; a source region of
10 said one conductivity type formed adjacent the walls of each of said trenches and diffused into the top of said epitaxial layer; a source contact connected to at least said source regions; a drain contact connected to said substrate; whereby said MOSFET has a reduced on
15 resistance.

5. The MOSFET of claim 4 wherein said source contact is connected to said source region only, whereby said MOSFET is bidirectional.

6. The MOSFET of claim 4 wherein said source contact is connected to said epitaxially deposited layer.

7. ~~The~~ MOSFET of claim 4 wherein said one conductivity type is the P-type.

8. The MOSFET of claim 7 wherein said epitaxial region has a resistivity of about 0.17 ohm cm and a thickness of about 2.5 μm .

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